

WHAT IS CLAIMED IS:

1 1. A method of forwarding packets comprising:
2 storing each one of a plurality of packets in one of a plurality of behavioral
3 queues according to a plurality of flow behaviors;
4 assigning a weighting to said plurality of behavioral queues; and
5 forwarding said plurality of packets from said plurality of behavioral queues
6 according to said weighting.

1 2. The method of claim 1, wherein one of said flow behaviors is a well
2 behaved flow.

1 3. The method of claim 1, wherein one of said flow behavior is a non-
2 adaptive aggressive flow.

1 4. The method of claim 1, wherein said weighting is predetermined.

1 5. The method of claim 1, wherein said weighting is dynamically
2 calculated according to a network traffic condition.

1 6. The method of claim 1, wherein said weighting is based on a
2 proportion of a size of said plurality of behavioral queues.

1 7. The method of claim 1, wherein said weighting is based on a data rate
2 of said plurality of packets.

1 8. The method of claim 1, further comprising:
2 classifying said plurality of packets according to said plurality of flow
3 behaviors.

1 9. The method of claim 8, wherein said plurality of packets is
2 dynamically classified according to said plurality of flow behaviors.

1 10. The method of claim 8, wherein said plurality of packets is
2 dynamically classified according to a plurality of predefined packet parameters.

1 11. The method of claim 8, further comprising:
2 receiving said plurality of packets.

1 12. The method of claim 11, further comprising:
2 if said plurality of behavioral queues is full,
3 dropping said plurality of packets.

1 13. The method of claim 12, further comprising:
2 if said plurality of packets have said well behaved flow,
3 storing said plurality of packets in a well behaved flow behavioral
4 queue.

1 14. The method of claim 13, further comprising:
2 forwarding said plurality of packets according to said weighting of said well
3 behaved queue.

1 15. The method of claim 12, further comprising:
2 if said plurality of packets have said non-adaptive aggressive flow,
3 storing said plurality of packets in a non-adaptive aggressive flow
4 behavioral queue.

1 16. The method of claim 15, further comprising:
2 determining whether said non-adaptive aggressive flow behavioral queue has
3 reached a scheduling threshold.

1 17. The method of claim 16, wherein said scheduling threshold is
2 predetermined.

1 18. The method of claim 16, wherein said scheduling threshold is
2 dynamically calculated according to a network condition.

1 19. The method of claim 16, wherein said scheduling threshold is based on
2 a size of said non-adaptive aggressive flow behavioral queue.

1 20. The method of claim 16, wherein said scheduling threshold is based on
2 a data rate of said plurality of packets.

1 21. The method of claim 16, further comprising:
2 if said non-adaptive aggressive flow behavioral queue has reached said
3 scheduling threshold,
4 determining whether a packet forwarding schedule of said non-
5 adaptive aggressive flow behavioral queue requires adjustment.

1 22. The method of claim 21, further comprising:
2 if said packet forwarding schedule of said non-adaptive aggressive flow
3 behavioral queue requires adjustment,
4 adjusting said packet forwarding schedule of said non-adaptive
5 aggressive flow behavioral queue.

1 23. The method of claim 22, further comprising:
2 forwarding said plurality of packets according to said weighting of said non-
3 adaptive aggressive flow behavioral queue.

1 24. The method of claim 22, wherein said adjusting of said packet
2 forwarding schedule of said non-adaptive aggressive flow behavioral queue is done
3 according to a predetermined scheme.

1 25. The method of claim 22, wherein said adjusting of said packet
2 forwarding schedule of said non-adaptive aggressive flow behavioral queue is done
3 dynamically according to said network traffic condition.

1 26. The method of claim 21, further comprising:
2 if said packet forwarding schedule of said non-adaptive aggressive flow
3 behavioral queue does not require adjustment,

4 forwarding said plurality of packets according to said weighting of said
5 non-adaptive aggressive flow behavioral queue.

1 27. A network element comprising:
2 means for storing each one of a plurality of packets in one of a plurality of
3 behavioral queues according to a plurality of flow behaviors;
4 means for assigning a weighting to said plurality of behavioral queues; and
5 means for forwarding said plurality of packets from said plurality of
6 behavioral queues according to said weighting.

1 28. The network element of claim 27, wherein one of said flow behaviors
2 is a well behaved flow.

1 29. The network element of claim 27, wherein one of said flow behavior is
2 a non-adaptive aggressive flow.

1 30. The network element of claim 27, wherein said weighting is
2 predetermined.

1 31. The network element of claim 27, wherein said weighting is
2 dynamically calculated according to a network traffic condition.

1 32. The network element of claim 27, wherein said weighting is based on a
2 proportion of a size of said plurality of behavioral queues.

1 33. The network element of claim 27, wherein said weighting is based on a
2 data rate of said plurality of packets.

1 34. The network element of claim 27, further comprising:
2 means for classifying said plurality of packets according to said plurality of
3 flow behaviors.

1 35. The network element of claim 34, wherein said plurality of packets is
2 dynamically classified according to said plurality of flow behaviors.

1 36. The network element of claim 34, wherein said plurality of packets is
2 dynamically classified according to a plurality of predefined packet parameters.

1 37. The network element of claim 8, further comprising:
2 means for receiving said plurality of packets.

1 38. The network element of claim 37, further comprising:
2 means for dropping said plurality of packets if said plurality of behavioral
3 queues is full.

1 39. The network element of claim 38, further comprising:
2 means for storing said plurality of packets in a well behaved flow behavioral
3 queue if said plurality of packets have said well behaved flow.

1 40. The network element of claim 39, further comprising:
2 means for forwarding said plurality of packets according to said weighting of
3 said well behaved queue.

1 41. The network element of claim 38, further comprising:
2 means for storing said plurality of packets in a non-adaptive aggressive flow
3 behavioral queue if said plurality of packets have said non-adaptive
4 aggressive flow.

1 42. The network element of claim 41, further comprising:
2 means for determining whether said non-adaptive aggressive flow behavioral
3 queue has reached a scheduling threshold.

1 43. The network element of claim 42, wherein said scheduling threshold is
2 predetermined.

1 44. The network element of claim 42, wherein said scheduling threshold is
2 dynamically calculated according to a network condition.

1 45. The network element of claim 42, wherein said scheduling threshold is
2 based on a size of said non-adaptive aggressive flow behavioral queue.

1 46. The network element of claim 42, wherein said scheduling threshold is
2 based on a data rate of said plurality of packets.

1 47. The network element of claim 42, further comprising:
2 means for determining whether a packet forwarding schedule of said non-
3 adaptive aggressive flow behavioral queue requires adjustment if said
4 non-adaptive aggressive flow behavioral queue has reached said
5 scheduling threshold.

1 48. The network element of claim 47, further comprising:
2 means for adjusting said packet forwarding schedule of said non-adaptive
3 aggressive flow behavioral queue if said packet forwarding schedule of
4 said non-adaptive aggressive flow behavioral queue requires
5 adjustment.

1 49. The network element of claim 48, further comprising:
2 means for forwarding said plurality of packets according to said weighting of
3 said non-adaptive aggressive flow behavioral queue.

1 50. The network element of claim 48, wherein said adjusting of said packet
2 forwarding schedule of said non-adaptive aggressive flow behavioral queue is done
3 according to a predetermined scheme.

1 51. The network element of claim 48, wherein said adjusting of said packet
2 forwarding schedule of said non-adaptive aggressive flow behavioral queue is done
3 dynamically according to said network traffic condition.

1 52. The network element of claim 47, further comprising:
2 means for forwarding said plurality of packets according to said weighting of
3 said non-adaptive aggressive flow behavioral queue if said packet
4 forwarding schedule of said non-adaptive aggressive flow behavioral
5 queue does not require adjustment.

1 53. A computer program product for forwarding packets, encoded in
2 computer readable media, said program product comprising a set of instructions
3 executable on a computer system, said set of instructions is configured to
4 store each one of a plurality of packets in one of a plurality of behavioral
5 queues according to a plurality of flow behaviors;
6 assign a weighting to said plurality of behavioral queues; and
7 forward said plurality of packets from said plurality of behavioral queues
8 according to said weighting.

1 54. The computer program product of claim 53, wherein one of said flow
2 behaviors is a well behaved flow.

1 55. The computer program product of claim 53, wherein one of said flow
2 behavior is a non-adaptive aggressive flow.

1 56. The computer program product of claim 53, wherein said weighting is
2 predetermined.

1 57. The computer program product of claim 53, wherein said weighting is
2 dynamically calculated according to a network traffic condition.

1 58. The computer program product of claim 53, wherein said weighting is
2 based on a proportion of a size of said plurality of behavioral queues.

1 59. The computer program product of claim 53, wherein said weighting is
2 based on a data rate of said plurality of packets.

1 60. The computer program product of claim 53, said set of instructions is
2 further configured to:

3 classify said plurality of packets according to said plurality of flow behaviors.

1 61. The computer program product of claim 60, wherein said plurality of
2 packets is dynamically classified according to said plurality of flow behaviors.

1 62. The computer program product of claim 60, wherein said plurality of
2 packets is dynamically classified according to a plurality of predefined packet
3 parameters.

1 63. The computer program product of claim 60, said set of instructions is
2 further configured to
3 receive said plurality of packets.

1 64. The computer program product of claim 63, said set of instructions is
2 further configured to
3 if said plurality of behavioral queues is full,
4 drop said plurality of packets.

1 65. The computer program product of claim 64, said set of instructions is
2 further configured to
3 if said plurality of packets have said well behaved flow,
4 store said plurality of packets in a well behaved flow behavioral queue.

1 66. The computer program product of claim 65, said set of instructions is
2 further configured to
3 forward said plurality of packets according to said weighting of said well
4 behaved queue.

67. The computer program product of claim 64, said set of instructions is further configured to

if said plurality of packets have said non-adaptive aggressive flow,
store said plurality of packets in a non-adaptive aggressive flow
behavioral queue.

68. The computer program product of claim 67, said set of instructions is further configured to

determine whether said non-adaptive aggressive flow behavioral queue has reached a scheduling threshold.

69. The computer program product of claim 68, wherein said scheduling threshold is predetermined.

70. The computer program product of claim 68, wherein said scheduling threshold is dynamically calculated according to a network condition.

71. The computer program product of claim 68, wherein said scheduling threshold is based on a size of said non-adaptive aggressive flow behavioral queue.

1 72. The computer program product of claim 68, wherein said scheduling
2 threshold is based on a data rate of said plurality of packets.

1 73. The computer program product of claim 68, said set of instructions is
2 further configured to

if said non-adaptive aggressive flow behavioral queue has reached said scheduling threshold,
determine whether a packet forwarding schedule of said non-adaptive aggressive flow behavioral queue requires adjustment.

1 74. The computer program product of claim 73, said set of instructions is
2 further configured to

3 if said packet forwarding schedule of said non-adaptive aggressive flow
4 behavioral queue requires adjustment,
5 adjust said packet forwarding schedule of said non-adaptive aggressive
6 flow behavioral queue.

1 75. The computer program product of claim 74, said set of instructions is
2 further configured to

3 forward said plurality of packets according to said weighting of said non-
4 adaptive aggressive flow behavioral queue.

1 76. The computer program product of claim 74, wherein said adjusting of
2 said packet forwarding schedule of said non-adaptive aggressive flow behavioral
3 queue is done according to a predetermined scheme.

1 77. The computer program product of claim 74, wherein said adjusting of
2 said packet forwarding schedule of said non-adaptive aggressive flow behavioral
3 queue is done dynamically according to said network traffic condition.

1 78. The computer program product of claim 73, said set of instructions is
2 further configured to

3 if said packet forwarding schedule of said non-adaptive aggressive flow
4 behavioral queue does not require adjustment,
5 forward said plurality of packets according to said weighting of said
6 non-adaptive aggressive flow behavioral queue.

1 79. A network element comprising:
2 a processor;
3 a memory coupled to said processor; and
4 a network interface coupled to said processor, said processor is configured to
5 store each one of a plurality of packets in one of a plurality of
6 behavioral queues according to a plurality of flow behaviors,
7 assign a weighting to said plurality of behavioral queues, and
8 forward said plurality of packets from said plurality of behavioral
9 queues according to said weighting.

1 80. The network element of claim 79, wherein one of said flow behaviors
2 is a well behaved flow.

1 81. The network element of claim 79, wherein one of said flow behavior is
2 a non-adaptive aggressive flow.

1 82. The network element of claim 79, wherein said weighting is
2 predetermined.

1 83. The network element of claim 79, wherein said weighting is
2 dynamically calculated according to a network traffic condition.

1 84. The network element of claim 79, wherein said weighting is based on a
2 proportion of a size of said plurality of behavioral queues.

1 85. The network element of claim 79, wherein said weighting is based on a
2 data rate of said plurality of packets.

1 86. The network element of claim 79, said processor is further configured
2 to
3 classify said plurality of packets according to said plurality of flow behaviors.

1 87. The network element of claim 86, wherein said plurality of packets is
2 dynamically classified according to said plurality of flow behaviors.

1 88. The network element of claim 86, wherein said plurality of packets is
2 dynamically classified according to a plurality of predefined packet parameters.

1 89. The network element of claim 86, said processor is further configured
2 to
3 receive said plurality of packets.

1 90. The network element of claim 89, said processor is further configured
2 to
3 if said plurality of behavioral queues is full,
4 drop said plurality of packets.

1 91. The network element of claim 90, said processor is further configured
2 to
3 if said plurality of packets have said well behaved flow,
4 store said plurality of packets in a well behaved flow behavioral queue.

1 92. The network element of claim 91, said processor is further configured
2 to
3 forward said plurality of packets according to said weighting of said well
4 behaved queue.

1 93. The network element of claim 90, said processor is further configured
2 to
3 if said plurality of packets have said non-adaptive aggressive flow,
4 store said plurality of packets in a non-adaptive aggressive flow
5 behavioral queue.

1 94. The network element of claim 93, said processor is further configured
2 to

3 determine whether said non-adaptive aggressive flow behavioral queue has
4 reached a scheduling threshold.

1 95. The network element of claim 94, wherein said scheduling threshold is
2 predetermined.

1 96. The network element of claim 94, wherein said scheduling threshold is
2 dynamically calculated according to a network condition.

1 97. The network element of claim 94, wherein said scheduling threshold is
2 based on a size of said non-adaptive aggressive flow behavioral queue.

1 98. The network element of claim 94, wherein said scheduling threshold is
2 based on a data rate of said plurality of packets.

1 99. The network element of claim 94, said processor is further configured
2 to

3 if said non-adaptive aggressive flow behavioral queue has reached said
4 scheduling threshold,
5 determine whether a packet forwarding schedule of said non-adaptive
6 aggressive flow behavioral queue requires adjustment.

1 100. The network element of claim 99, said processor is further configured
2 to

3 if said packet forwarding schedule of said non-adaptive aggressive flow
4 behavioral queue requires adjustment,
5 adjust said packet forwarding schedule of said non-adaptive aggressive
6 flow behavioral queue.

1 101. The network element of claim 100, said processor is further configured

2 to

3 forward said plurality of packets according to said weighting of said non-

4 adaptive aggressive flow behavioral queue.

1 102. The network element of claim 100, wherein said adjusting of said

2 packet forwarding schedule of said non-adaptive aggressive flow behavioral queue is

3 done according to a predetermined scheme.

1 103. The network element of claim 100, wherein said adjusting of said

2 packet forwarding schedule of said non-adaptive aggressive flow behavioral queue is

3 done dynamically according to said network traffic condition.

1 104. The network element of claim 99, said processor is further configured

2 to

3 if said packet forwarding schedule of said non-adaptive aggressive flow

4 behavioral queue does not require adjustment,

5 forward said plurality of packets according to said weighting of said

6 non-adaptive aggressive flow behavioral queue.